

Claims

1. A natamycin dosage form comprising microcapsules where natamycin is encapsulated within a physiologically acceptable shell to provide a protected food preservative natamycin product.
5
2. A natamycin dosage form according to claim 1, wherein said shell is effective in substantially retaining said natamycin within said shell during processing of said food product.
10
3. A natamycin dosage form according to claim 1, wherein said shell is effective in providing slow or delayed release of said encapsulated natamycin into said food product.
- 15 4. A natamycin dosage form according to claim 1, wherein said shell is effective in protecting said encapsulated natamycin from degradation by conditions prevailing in the production of a product whereto said encapsulated natamycin is added and in providing release of natamycin in said finished product.
- 20 5. A natamycin dosage form according to claim 1, wherein said encapsulation is provided by a process selected from a fluidized bed process, liposome encapsulation, spray drying, spray cooling, extrusion, co-extrusion, coacervation and combinations thereof.
- 25 6. A natamycin dosage form according to claim 1 wherein said shell is made of a material selected from the group consisting of hydrophobic materials, hydrocolloid materials and mixtures or combinations thereof.
- 30 7. A natamycin dosage form according to claim 6 wherein said hydrophobic material is chosen from lipids and resins including fatty acids, fats, oils, emulsifiers, fatty alcohols, waxes and mixtures or combinations thereof.

8. A natamycin dosage form according to claim 7, wherein said hydrophobic material is selected from the group consisting of food grade animal oils and fats, fully hydrogenated vegetable or animal oils, partially hydrogenated vegetable or animal oils, unsaturated, hydrogenated or fully hydrogenated fatty acids, unsaturated, partially 5 hydrogenated or fully hydrogenated fatty acid monoglycerides and diglycerides, unsaturated, partially hydrogenated or fully hydrogenated esterified fatty acids of monoglycerides or diglycerides, unsaturated, partially hydrogenated or fully hydrogenated free fatty acids, other emulsifiers, animal waxes, vegetable waxes, mineral waxes, synthetic waxes, natural and synthetic resins and mixtures thereof.

10

9. A natamycin dosage form according to claim 6 wherein said hydrocolloid comprises a soluble or dispersible coating material selected from food grade gums, polysaccharides, proteins, shellac and mixtures or combinations thereof.

15

10. A natamycin dosage form according to claim 9, wherein said hydrocolloid is selected from cellulosic derivatives including hydroxy propyl methyl cellulose, cellulose acetate phthalate, carboxy methyl cellulose, methyl cellulose and microcrystalline cellulose, sodium alginate, gum arabic, gellan gum, guar gum, agar gum, pectin, amidified pectin, carrageenan, gelatine, chitosan, mesquite gum, 20 hyaluronic acid, methyl acrylic copolymers, such as Eudragit®, psyllium, tamarind, xanthan, locust bean gum, wellan gum, zein, shellac, whey protein, soy protein, sodium caseinate, synthetic or natural water-soluble polysaccharides, proteins and other hydrocolloids, with or without fatty acids, fatty alcohol, plasticizers including glycerol, polyethyleneglycol and other low molecular weight hydrophilic alcohols, or 25 combinations of any of said hydrocolloids.

30

11. A natamycin dosage form according to claim 1 wherein said shell is provided by co-processing natamycin with an encapsulating material, which is in an aqueous or lipidic solution or suspension or in a molten state.

12. A natamycin dosage form according to claim 11, wherein said natamycin is in aqueous suspension or comprises a dry powder.

- 13 .A natamycin dosage form according to claim 1, which comprises microcapsules having a solidified hydrophobic shell matrix, encapsulated aqueous beads which are further encapsulated in the solidified hydrophobic shell matrix, and natamycin
5 incorporated in the encapsulated aqueous beads.
14. A natamycin dosage form according to claim 1, wherein the percentage of active natamycin in said protected natamycin product is from 1 to 80% by weight.
- 10 15. A natamycin dosage form according to claim 14, wherein said percentage is between 15 and 50% by weight.
16. A natamycin dosage form according to claim 15, wherein said percentage is between 30 and 40% by weight.
- 15 17. A process for preparing a natamycin dosage form comprising
 - co-processing natamycin with a physiologically acceptable encapsulating material to cause said material to encapsulate said natamycin within a shell, and
 - recovering a protected food preservative natamycin product.
- 20 18. A process according to claim 17, wherein said encapsulation process is selected from a fluidized bed process, liposome encapsulation, spray drying, spray cooling, extrusion, co-extrusion, coacervation and mixtures thereof.
- 25 19. A process according to claim 17 wherein said encapsulating material comprises a material selected from the group consisting of hydrophobic materials, hydrocolloid materials and mixtures or combinations thereof.
- 30 20. A process according to claim 17, wherein said encapsulation process comprises fluidized bed encapsulation of natamycin with an encapsulating material in an aqueous solution or suspension or in a molten state.

21. A process according to claim 17, wherein said encapsulation process comprises coacervation of natamycin with an encapsulating material.

22. A process according to claim 19, wherein said encapsulating material comprises a
5 hydrocolloid or a mixture of hydrocolloids.

23. A process according to claim 17, which includes the steps of

- a) providing an aqueous phase and natamycin incorporated in the aqueous phase,
- b) providing a hydrophobic phase in a molten form,
- 10 c) incorporating or dissolving an encapsulating material or mixture of encapsulating materials in the aqueous phase or in the hydrophobic phase
- d) combining the aqueous phase with the hydrophobic phase and homogenizing or mixing the combined phases to form a water-in-oil emulsion,
- e) encapsulating the aqueous phase in the emulsion, whereby a dispersion comprising
15 encapsulated aqueous beads is formed and the natamycin is encapsulated in the aqueous beads, and
- f) processing the dispersion obtained in step e) to form microcapsules where the encapsulated aqueous beads are further encapsulated in solidified hydrophobic shell material.

20

24. A method for the preservation of a food product comprising adding to said food product an effective food-preserving amount of natamycin which is encapsulated within a physiologically acceptable shell.

25. A method according to claim 24, wherein said encapsulated natamycin is added to said food product prior to or in connection with the production of said food product and said shell is effective in protecting said encapsulated natamycin from degradation by conditions used in the production or storage of said food product said shell providing release of natamycin in said food product.

30

26. A method according to claim 25, wherein said conditions are selected from natamycin-degrading heat and high or low pH.

27. A method according to claim 24 wherein said food product is selected from a salad dressing, a condiment, a ketchup, puree, a salsa sauce, a pickle, a dip, an acidic dairy product including natural cheese, cottage cheese, acidified cheese, cream cheese,
5 yoghurt, sour cream and processed cheese, a fruit juice, an acidic drink, an alcoholic drink including wine and beer, a chilled dough, a cooked or uncooked bakery product, a dairy filling or topping, a surface glaze or coating a marinade, marinated or breaded meat or poultry, a pizza topping or base, a fast food product, a kit for making a snack or a meal, a kit for making a bakery product, combinations thereof, pet food and
10 broiler feed.
28. A method according to claim 24 wherein said encapsulated natamycin is included in a dough for a yeast-leavened or non-yeast-leavened bakery product.
- 15 29. A method according to claim 28, wherein said dough is baked into bread and subsequently sliced.
30. A preserved food product which comprises as a preservative an effective food preserving amount of natamycin which is encapsulated within a physiologically acceptable shell.
20
31. A food product according to claim 30 wherein said food product is selected from a salad dressing, a condiment, a ketchup, a puree, a salsa sauce, a pickle, a dip, an acidic dairy product including natural cheese, cottage cheese, acidified cheese, cream cheese,
25 yoghurt, sour cream and processed cheese, a fruit juice, an acidic drink, an alcoholic drink, a chilled dough, a cooked or uncooked bakery product, a dairy filling or topping, a surface glaze or coating, a marinade, marinated meat or poultry, breaded meat or poultry, a pizza topping or base, a fast food product, a kit for making a snack or meal, a kit for making a bakery product, combinations thereof, pet food and broiler feed.
30
32. A food product according to claim 31 wherein said bakery product is sliced or cut bread.